Fluid inclusion of Pan-African high grade metamorphism of Southern Sinai, Egypt

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Fluid inclusions in the leucosomes of Wadi Feiran migmatites show that CO_2, H_2O and (H_2O-CO_2) fluids were likely to have been present when partial melting began in these rocks. Low salinity, aqueous fluid, to lesser extent CO_2 rich, fluids are the most abundant fluids. The present study suggests that high density CO_2 inclusions were formed at the earliest stage, while H_2O inclusions were formed at a later stage. In an intermediate stage, low density CO_2 and H_2O CO_2 inclusions were formed. At the early stage of uplift and during the melt crystallization, the CO_2 bearing vapors were trapped at grain boundaries. At the late stage of uplift, H_2O released at the time of crystallization of the melt was trapped as inclusions.

Origin of pargasitic megacryst in the neogene volcanic rocks of central Iran

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The exposure of Neogene volcanic rocks mainly in Qom province in Iran that belongs to the Urumieh-Dokhtar Magmatic Arc (UDMA) as Sakht-e-Hesar and Khastak area (Fig. 1). The Neogene volcanic activities are divided into two phases: Ngv_1 and Ngv_2. At the first stage (Ngv_1), volcanic rocks contain basalt to andesitic-basalt as lava or pyroclastic materials. The explosive event was followed by the volcanic to sub-volcanic associations of Ngv_2 with products of mainly andesitic to rhyiolitic composition (second stage) [1]. This volcanic complex consists of few centimetre amphibole megacrysts that mineral geochemistry analyses present them as pargasite. These amphiboles transformed to pyroxene, plagioclase and magnetite which indicate reaction between sub-alkaline magma and pargasite megacrysts. It seems that these megacrysts are originated from metasomatized mantle during fractional melting. Probably, these amphiboles ascend and emplacement in magma chamber and non-equilibrium geochemistry relation was found with saturated melt. The mantle metasomatism patterns in this area are inferred from subduction of the Neo-Tethys beneath mantle wedge of the Central Iranian Block during Mesozoic period.

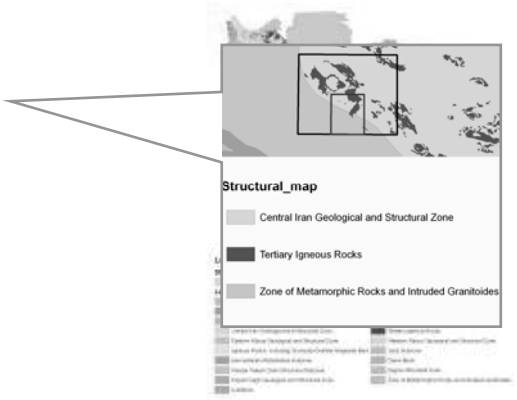

Figure 1: Structural map of Iran and selected Neogene complex

[1] Emami (1991) Explanatory text of the Qom quadrangle map, Geological Quadrangle No. E6, Geological Survey of Iran.